

NOTES ON PHYLLOPHAGA SOCIATA (HORN) WITH A
DESCRIPTION OF THE LARVA(Coleoptera: Scarabaeidae)¹

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The discovery that scarabaeid larvae are common under and near ant nests in central Oregon has led to a number of new findings regarding their distribution and abundance. On May 21, 1961, while on a collecting trip near Bend, Oregon, the writer found a female of an unusual *Phyllophaga* in soil near the nest of the harvester ant, *Pogonomyrmex occidentalis* Cresson. Later in June, several other adults and numerous larvae of an unknown *Phyllophaga*, were dug from other ant nests in the same general area.

Study of the adults revealed that this species is *Phyllophaga sociata* (Horn). Identification of the larvae was confirmed by rearing five of the above-mentioned larvae to the adult stage and by obtaining nine first-stage larvae from eggs laid by two females, isolated in rearing cages with juniper as a food plant.

This interesting species was described by Horn in 1878 under the name *Listrochelus sociatus*, in his revision of the species of the genus *Listrochelus* of the United States. Saylor, however, in 1938, removed the species from *Listrochelus* to *Phyllophaga*, *sensu stricto*, based on studies which he and E. A. Chapin had made preparatory to a revision of the subgenus *Listrochelus* (see also Saylor, 1940). Luginbill and Painter (1953) also included the species in *Phyllophaga*, *sensu stricto*.

According to M. W. Sanderson (personal communication), *Ph. sociata* belongs in a new group of species, separate from both the subgenus *Listrochelus* and *Phyllophaga sensu stricto*, including *Ph. xerophila* Saylor, *Ph. stohleri* Saylor, *Ph. reevesi* Saylor, *Ph. galeanae* Saylor and several undescribed species. Study of reared larvae of *Ph. (Listrochelus) mucoreus* LeConte and *Ph. (Listrochelus) pulcher*, (Linell) (loaned by the USNM) and other *Listrochelus* (Ritcher, 1949) shows that they agree with *Ph. sociata* in having the last three pairs of abdominal spiracles reduced in size. Their rasters, however, and the setation of the head are very similar to those of many *Phyllophaga*, *sensu stricto*.

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Larvae of *Ph. sociata* are quite unique from these other two subgenera in possessing a totally different raster, a different pattern of setation on the head, and a row of strong fossorial setae on each prothoracic leg. In fact, the larval characters of this species are so distinct that it could be placed in a separate genus.

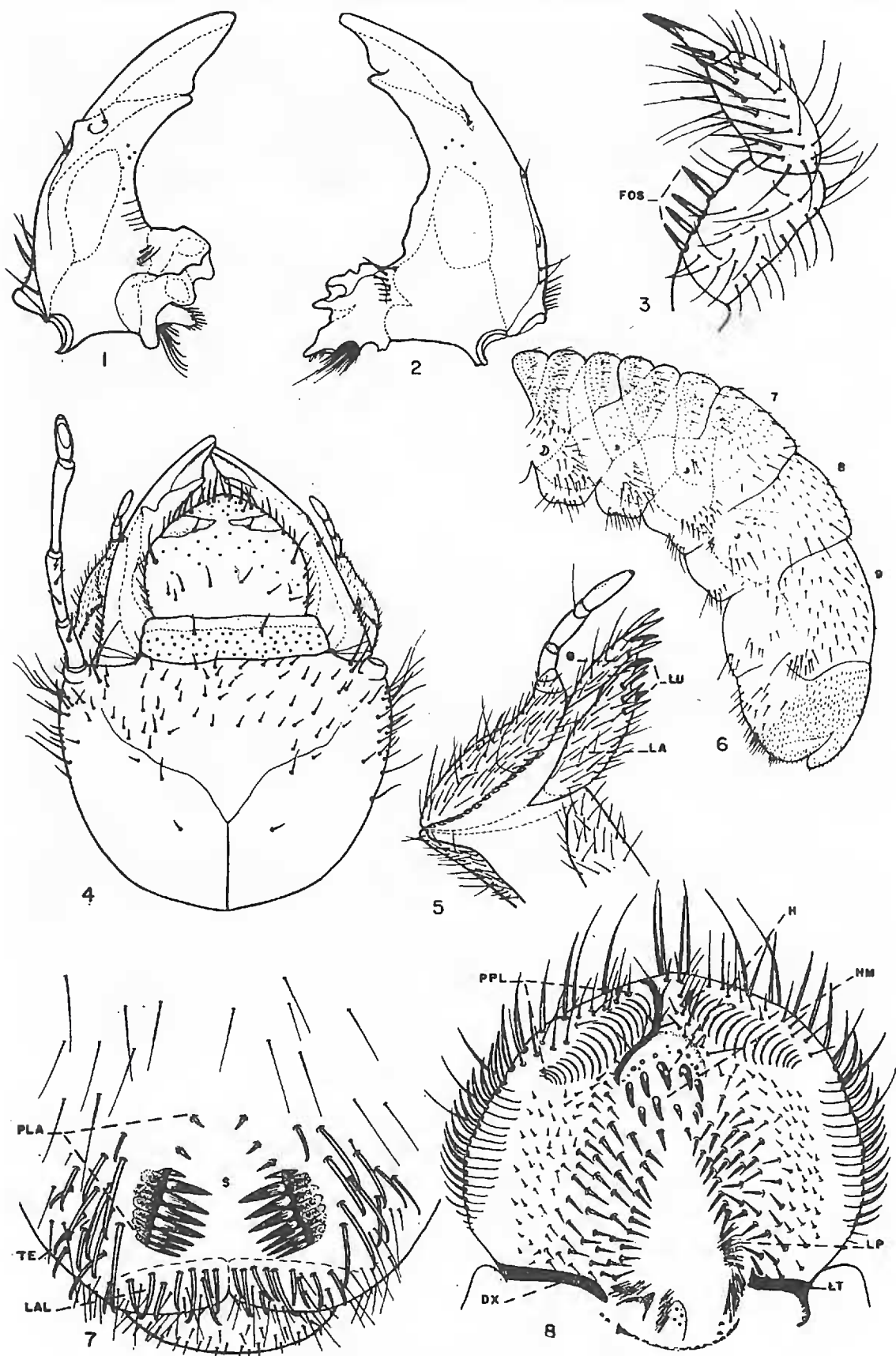
Luginbill and Painter (1953) erroneously listed *Ph. sociata* as a southwestern species. The distribution is given by Leng (1920 as Nevada, Idaho and Oregon. Based on material in the Hatch collection, at the University of Washington, and in the collection at Oregon State University, this species has been collected from the following localities: Oregon—*Baker Co.*: Durkee. *Deschutes Co.*: 7 miles N. of Tumalo, Redmond, 10 miles SE of Sisters, 13 miles SE of Sisters, 15 miles east of Sisters, and 1 mile N. of Cline Falls. *Harney Co.*: "P" Ranch. *Jefferson Co.*: Cove State Park (near Culver). Washington—*Bent Co.*: Prosser. *Grant Co.*: Moses Lake, Soap Lake, People's Oil Well.

Adults of *Ph. sociata* were collected at black light in central Oregon during June of 1961. All the Hatch specimens (25) were taken during May. My studies show that the species overwinters both in the larval and adult stages, indicating a life cycle of two or three years. Pupation occurs in July and August with transformation to the adult stage occurring 25 to 27 days later (25°-26°C). Adults remain in the soil until the following spring before emerging.

PHYLLOPHAGA SOCIATA (Horn), Third-stage Larva
(Figs. 1-8)

The following description is based on ten third-stage larvae and cast skins of three third-stage larvae reared to the adult stage. The larvae were dug from soil beneath nests of *Pogonomyrmex occidentalis* Cresson, 13 miles southeast of Sisters, Oregon, (Deschutes Co.), July 6, 1961, by P. O. Ritcher and David Smith. The larvae of this species may be distinguished by the following characters:

Maximum width of head capsule 3.3 to 3.5 mm. Head (Fig. 4) yellow-brown in color, faintly reticulated. Anterior half of frons with numerous setae; with about 17 setae in a transverse patch near the frontal margin, with 15 to 20 posterior frontal setae on each side, and with one long seta at each anterior angle. Dorso-epicranial setae inconspicuous, 2 or 3 on each side. Labrum symmetrical. Epipharynx (Fig. 8) with well-developed epizygum and zygum. Proplegmata well developed, each elliptical with 17 to 18 proplegma. Proplegma long, narrow, and curved. Haptomerum



EXPLANATION OF FIGURES

Phyllophaga sociata (Horn). Fig. 1, Left mandible, dorsal view. Fig. 2, right mandible, dorsal view. Fig. 3, Prothoracic leg, distal portion. FOS, fossorial setae. Fig. 4, head. Fig. 5, left maxilla. G, galea; LA, lacinia; LU, lacinial unci. Fig. 6, portion of abdomen showing segments 5-10. Fig. 7, venter of last abdominal segment. LAL, lower anal lobe; PLA, palidium; S, septula; TE, tegillum. Fig. 8, Epipharynx. DX, dextotorma; H, helus; HM, haptomerum; LP, laeophoba; LT, laeotorma; PPL, proplegmatium.

set with 8 to 10 stout heli, the anterior 4 or 5 in a curved row. No sensilla among the chaetoparia. Haptolachus without crepidal punctures. Pedium with a short laeophoba, anterior to the laeotorma, consisting of 3 to 6 flattened, branched filaments. Dexiophoba brushlike, with about 15 filaments, inserted at base of pedium just anterior to nesium externum (= sclerotized plate).

Dorso-exterior region of mandibles (Figs. 1 and 2) without either setae or pits. Setae in dorso-molar region of right mandible limited to a row of 5 to 8 setae inserted at the base of the molar structure. Dorso-molar region of left mandible with a cluster of 4 or 5 setae near the base of the molar structure. Maxilla (Fig. 5), with a regular row of 13 to 17 truncate stridulatory teeth bordering stipes. Lacinia with a longitudinal row of 3 unci on inner face and an anterior, oblique row of 3 stout, spinelike setae. Galea and lacinia, on inner surface, separated by a non-sclerotized membranous area. Last segment of antenna with a large ovate sensory spot. Eyespots absent.

Femora of prothoracic legs (Fig. 3) each with a ventral row of 4 stout, fossorial setae (worn down in older specimens). Claws of prothoracic legs unusually long and stout, claws of mesothoracic legs rather long and slender, claws of metathoracic leg much reduced in size. Last 3 pairs of abdominal spiracles much smaller than spiracles on abdominal segments 1 to 5 (Fig. 6). Respiratory plates not surrounding bullae.

Raster (Fig. 7) with 2 widely separated, prominent palidia, diverging posteriorly. Posteriorly, each palidium consists of a comb-like row of 5 to 8 closely set, long, stout, flattened setae; anteriorly each palidium is continued as a sparsely set row of 3 or 4 short, sub-conical setae. Septula triangular. Laterad of each comb-like portion of each palidia is a patch of 10 to 14 hamate setae. Preseptular hamate setae usually absent. Anal slit Y-shaped with arms of Y about twice as long as stem. Dorsal and ventral anal lobes densely covered with fine, long and short setae. Lobes of lower anal lips bordered anteriorly with a row of 6 to 11 slender hamate setae.

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